MOTOTRBO™ MTR3000 REPEATER FOR DIGITAL SYSTEMS

SALES GUIDE

INTRODUCTION

MTR3000 is a MOTOTRBO™ integrated voice and data repeater designed to meet the requirements of small municipalities, utility companies and professional organizations. The MTR3000 operates in all MOTOTRBO system configurations, delivering increased capacity, spectral efficiency, integrated data applications, and enhanced voice communications.

In addition, the MTR3000 can also operate in analog mode for conventional and LTR systems, providing a flexible high power base station/repeater.

MTR3000 FEATURES

MTR3000 standard

- Operates in analog or MOTOTRBO digital mode with an LED indicating mode of operation.
- Reliable 100W Continuous Duty Cycle Operation.
- 12.5 or 25 kHz programmable channel spacing.
- Analog and MOTOTRBO digital conventional are all standard in one base station without the cost of additional software or hardware.
- Power supply functions over a wide range of voltages.
- RoHS (Restriction of Hazardous Substances) compliant.

MTR3000 programmed in MOTOTRBO mode

- Supports two simultaneous voice paths in digital 12.5 kHz TDMA (6.25e compliant).
- Divides existing channel into two timeslots delivering twice the capacity through a single repeater.
- Supports MOTOTRBO IP Site Connect for increased wide area coverage.
- Supports MOTOTRBO Dynamic Mixed Mode (DMM) operation.
- Supports all MOTOTRBO modes of operation.

MTR3000 Serviceability

- Repeater diagnostic and control software provides remote or local site monitoring.
- Easy to replace components with functionally separate Field Replaceable Units (FRUs).
- Software-based design simplifies feature upgrades.
- Easy access to station ports (no need to remove the front panel) shortening installation and maintenance time.
- For ease of installation, minimal station alignment is needed.
- Backed by Motorola's Standard 2-year Warranty.

MTR2000 VS. MTR3000 COMPARISON

The following chart reflects the features and functionality differences between the MTR2000 and the MTR3000. Refer to MOTOROLA ON LINE for new station features as they become available.

CAPABILITY	MTR2000	MTR3000
AIR INTERFACE/CONVENTIONAL		
Analog Conventional	Yes	Yes
MOTOTRBO (2-SLOT TDMA)	No	Yes
STATION OPERATION		
Base Radio Analog	Yes	Yes
Base Radio MOTOTRBO	No	No
Repeater Analog	Yes	Yes
Repeater MOTOTRBO	No	Yes
Half Duplex	Yes	Yes
Full Duplex	Yes	Yes
AIR INTERFACE/TRUNKED		
Privacy Plus/SmartNet	Yes	No
Analog Trunking (LTR & Passport)	Yes	Yes
MIXED MODE CAPABILITY (ANALOG OR MOTOTRBO)		
Static Mixed Mode	No	Yes
FREQUENCY		
UHF 330-403	Yes	No
UHF 403-470	Yes	Yes
UHF 470-524	No	Yes
FREQUENCY REFERENCE		
Internal 1.5ppm (800)	Yes	No
Internal 1.5ppm (VHF, UHF)	Yes	Yes
Internal 0.1ppm (800, 900) (optional UHF/VHF)	No	Yes
External Reference Capable	Yes	Yes
CHANNELS		
Programmable Channels	32	16
CHANNEL FREQUENCY SPACING		
Channel Spacing	12.5/15/20/25/30kHz	12.5/15/20/25/30kHz
6.25 efficiency	No	Yes
NETWORK INTERFACE		
Ethernet	No	Yes
4-wire (E&M via GPIO)	Yes	Yes

CAPABILITY	MTR2000	MTR3000
VOTING		
Receive Only Station	Yes	No
Analog Voting	Yes	No
TRANSMITTER CAPABILITY		
Low Power (30/40W)	Yes	No
75/100 Watt Capability	Yes	Yes
Continuous Duty	Yes	Yes
AUX I/O		
Wildcard	Yes	No
GPIO (General Purpose Input/Output)	12 GPO and 11 GPI	7 GPIO and 2 GPI (standard)
Main Stand-by (hot switchover)	Yes	Yes
ADDITIONAL HARDWARE FEATURES		
RoHS compliancy	No	Yes
DB25 Connector (for 3rd party controllers)	No	Yes
Standard Pin Connector	No	Yes
ADDITIONAL SOFTWARE FEATURES		
IP Site Connect	No	Yes
RDAC (Radio Diagnostic & Control)	No	Yes

UPGRADE AN MTR2000 STATION TO AN MTR3000 STATION

For systems currently using the high power MTR2000 base station/repeater, a simple MTR3000 upgrade kit is available in order for the station to function on a MOTOTRBO system. This allows the user the ability to leverage their current investment.

- The MOTOTRBO MTR3000 upgrade is a hardware and software upgrade for MTR2000 users that are ready to move to digital operation.
- There is no need to pull out existing infrastructure.
- Simply replace the core module of the MTR2000, and program the station with the MOTOTRBO CPS, to enable it in a MOTOTRBO system.

CONSIDERATIONS BEFORE BEGINNING A MIGRATION PLAN

The purpose of an MTR2000 MOTOTRBO upgrade is to allow users to migrate to MOTOTRBO digital without having to purchase an entirely new station.
When upgrading to an MTR3000, use the following chart to ensure features and/or functionality is supported.

MTR2000 ANALOG UPGRADE CAPABILITY

MTR2000 FEATURE NAME	UPGRADE TO MTR3000
ANALOG AIR INTERFACE	
Conventional	Yes*
Privacy Plus/SmartNet	No
LTR	Yes
ANALOG STATION OPERATION	
Base Station	Yes*
Repeater	Yes*
Receive Only	No
CHANNEL CONFIGURATION	
Half Duplex	Yes
Full Duplex	Yes
FREQUENCY	
UHF 330-403	No
UHF 403-470	Yes
NETWORK INTERFACE	
4-wire (E&M via GPIO)	Yes
VOTING	
Analog Voting	No
TRANSMITTER CAPABILITY	
100 Watt Capability	Yes
CUSTOM PROGRAMMING	
Aux I/O	No
Wildcard Programming	No
HARDWARE PERIPHERAL COMPAT	
Duplexer	Yes
Preseletor	Yes
Circulator	Yes
External Frequency Reference	Yes
Antenna Relay	Yes
Argus Battery Charger	Yes

*You can upgrade an MTR2000 and still use the MTR3000 in analog mode. However, since some analog functionality would be lost in this transition, this application would be best applied to a customer who intends to migrate to MOTOTRBO at some time in the future.

Benefits to Migrating from a MTR2000 to an MTR3000

- Low cost: User pays a fraction of a new station price to upgrade their MTR2000.
- Easy to upgrade: Each hardware upgrade should take under 15 to 30 minutes.
- Ability to modify existing equipment reduces need to go out for bid.
- Hardware upgrade kits available at band launch dates.
- MOTOTRBO Digital Meets FCC mandate and offers an increased capacity.
- The MTR3000 in digital mode integrates voice and data and offers digital quality audio.
- Add IP Site Connect for wide area coverage.
- MTR3000 supports Dynamic Mixed Mode where the repeater will switch between digital and analog mode for a smoother migration to all digital communications.

UPGRADE STATION CONFIGURATION

Use the following chart to understand the station configurations that are availablefor MTR2000 and MTR3000.

IF YOUR STATION IS:	YOU WANT TO MIGRATE TO:	STATION UPGRADE NEEDED:
MTR2000 Analog Conventional	MOTOTRBO Digital Conventional	MTR2000 MOTOTRBO Upgrade Kit (T2003)
MTR2000 Analog Conventional	MOTOTRBO IP Site Connect	MTR2000 MOTOTRBO Upgrade Kit (T2003) & Premium f eature license, where required
MTR3000 or Upgraded MTR2000 MOTOTRBO Digital Conventional	MOTOTRBO IP Site Connect	Premium feature license where required

MTR3000 COMPARED TO THE 40 WATT MOTOTRBO REPEATER

Both the MTR3000 and the 40 watt MOTOTRBO repeater operate in both analog and MOTOTRBO digital mode. The MOTOTRBO portfolio has expanded to provide customers with two reliable station choices.

Consider MTR3000:

- If a customer needs a higher powered station, the 100 watt MTR3000 provides a higher power solution compared to the 40 watt MOTOTRBO repeater.
- If a customer is located in a high RF density area, the MTR3000 would be the best solution since it has higher receiver specs, which provides better RF interference protection.
- If a customer is operating in the T-band (512-524 MHz), since the 40 watt MOTOTRBO repeater does not operate at that frequency.
- If a customer already has an MTR2000 and desires MOTOTRBO, upgrading to an MTR3000 is a cost effective solution.
- If more General Purpose Input and Output (GPIO) programming options are needed, the MTR3000 provides nine GPIO/GPS compared to five in the 40 watt MOTOTRBO repeater.
- If station serviceability is a concern, the MTR3000 be a better choice because it is a FRU-based architecture and has front access service ports.

Consider the 40 watt MOTOTRBO repeater

- If low cost is the primary consideration, the 40 watt MOTOTRBO repeater is priced lower than the MTR3000.

ORDERING MTR3000 EXAMPLE:

MODEL/OPTION NOMANCLATUR	DESCRIPTION
ORDER MAIN MODEL	
T3000A	MTR3000 BASE RADIO
REQUIRED: SELECT 1 FREQUENCY	
X340MT	ADD : UHF 100W POWER (403-470)
X540MT	ADD : UHF 100W POWER (470-524)
REQUIRED FOR PROGRAMMING CPS: USB CABLE	
CLN8665A	HI-SPEED USB CABLE 6FT (TYPE A -B)
OPTIONAL: SELECT DUPLEXER	
X182UL	ADD : DUPLEXER, UHF 403-435 MHz
X182UM	ADD : DUPLEXER, UHF 435-470 MHz
X182UN	ADD : DUPLEXER, UHF 470-494 MHz
X182UH	ADD : DUPLEXER, UHF 494-512 MHz
OPTIONAL: SELECT PRESELECTOR (REQUIRED IF ORDERING X182, DUPLEXER)	
X265UL	ADD: PRESELECTOR, UHF(380–435 MHZ)
X265UM	ADD: PRESELECTOR, UHF(435–470 MHZ)
X265UH	ADD: PRESELECTOR, UHF(470–524 MHZ)

MODEL/OPTION NOMANCLATUR	DESCRIPTION
OPTIONAL: SELECT CIRCULATOR	
X676UL	ADD: CIRCULATOR, UHF (403–470 MHZ)
X676UH	ADD: CIRCULATOR, UHF (470–524 MHZ)
OPTIONAL SELECT ANTENNA RELAY (NOT COMPATIBLE IF ORDERING X182, DUPLEXER)	
X371BA	ADD: ANTENNA RELAY
OPTIONAL: SELECT POWER CABLE (NORTH AMERICA CABLE SHIPS STANDARD)	
X187AK	ADD : POWER CABLE, EUROPE
X162AE	ADD : POWER CABLE, UK
X191AF	ADD : POWER CABLE, AUSTRALIA
CA01520AA	ADD : POWER CABLE, DC
OPTIONAL: MOUNTING HARDWARE	
U178AB	ADD: CABINET MOUNT HARDWARE
X153BA	ADD: RACK MOUNT HARDWARE
OPTIONAL: MANUAL ON CD	
X347AF	ADD: MANUAL INSTALL & USER CD
OPTIONAL: SELECT SYSTEM CABLES	
X244AJ	ADD: AUXILIARY SYSTEM CABLE
X244AG	ADD: COMMUNITY REPEATER PANEL CABLE
X244AH	ADD: PHONE PATCH CABLE
C540AD	ADD: SYSTEM CONNECTOR CABLE
XA00032AA	ADD: ETHERNET CABLE 12'
OPTIONAL: SELECT TEST REPORT	
X699BA	ADD: MTR3000 FACTORY TEST REPORT
OPTIONAL: ADD FRU'S AS NECESSARY	
DLN6701A	FRU UHF 100W PA 403-470
DLN6702A	FRU UHF 100W PA 470-524
DLN6703A	FRU UHF 403-470 EXCITER
DLN6704A	FRU UHF 450-524 EXCITER
DLN6705A	FRU UHF 403-470 RECEIVER
DLN6706A	FRU UHF 450-524 RECEIVER
OPTIONAL: ADD FRU'S AS NECESSARY	
DLN6707A	FRU MTR3000 AC/DC POWER SUPPLY
DLN6719A	FRU STATION CONTROL TCXO
THN6700A	12" INDOOR CABINET
THN6701A	30" INDOOR CABINET
THN6702A	46" INDOOR CABINET
0782099W01	30" MODULAR RACK (16 RK U)
0782099W02	45" MODULAR RK (24 RK U)
0782099W03	52" MODULAR RK (27 RK U)
CLN6679A	RACK MOUNT HARDWARE
CLN8629A	MTR3000 INSTALLATION AND USER MANUAL

ORDERING MTR2000 MOTOTRBO UPGRADE EXAMPLE:

MODEL/OPTION NOMENCLATURE	DESCRIPTION
ORDER MAIN MODEL	
T2003A	MTR2000 MOTOTRBO UPGRADE
REQUIRED: SELECT 1 FREQUENCY	
X340MT	ADD : UHF 100W POWER (403-470)
REQUIRED FOR PROGRAMMING CPS: USB CABLE	
CLN8665A	HI-SPEED USB CABLE 6FT (TYPE A -B)
OPTIONAL: MANUAL ON CD	
X347AF	ADD: MANUAL INSTALL & USER CD
OPTIONAL: SELECT SYSTEM CABLES	
XA00032AA	ADD: ETHERNET CABLE 12'
OPTIONAL: ADD FRU'S AS NECESSARY	
DLN6701A	FRU UHF 100W PA 403-470
DLN6702A	FRU UHF 100W PA 470-524
DLN6703A	FRU UHF 403-470 EXCITER
DLN6704A	FRU UHF 450-524 EXCITER
DLN6705A	FRU UHF 403-470 RECEIVER
DLN6706A	FRU UHF 450-524 RECEIVER
DLN6707A	FRU MTR3000 AC/DC POWER SUPPLY
DLN6719A	FRU STATION CONTROL TCXO
THN6700A	12" INDOOR CABINET
THN6701A	30" INDOOR CABINET
THN6702A	46" INDOOR CABINET
0782099W01	30" MODULAR RACK (16 RK U)
0782099W02	45" MODULAR RK (24 RK U)
0782099W03	52" MODULAR RK (27 RK U)
CLN6679A	RACK MOUNT HARDWARE
CLN8629A	MTR3000 INSTALLATION AND USER MANUAL CD

ORDERING TIPS

- Model numbers are intuitive;
  MTR300 Station = T3000
  MTR2000 MOTOTRBO Upgrade = T2003
- Customer Programming Software (CPS) is required to Program both the T3000 and the T2003.
- The CPS is the same CPS used to program MOTOTRBO mobiles, portables & repeater stations.
- A standard type A to type B USB cable is needed to program the MTR3000.
- Cabinets and Racks are no longer ordered as options. They are ordered as parts.
- If customers are using specific features in MTR2000, be sure that their configuration is available prior to ordering the MTR3000 upgrade.
- There are no orderable peripheral options available for the MTR2000 MOTOTRBO upgrade. Customers will need to order FRU's if peripherals are desired.
- Only one freq option (X340) applies for UHF Upgrades since MTR2000 did not extend beyond 470 MHz.
- Manuals on MOTOROLA ONLINE and CDs are a no charge option (X347) for stations or upgrades, however, you must order the option as it is not automatically included with a station order.

MTR3000 FREQUENTLY ASKED QUESTIONS (FAQ)

Will all frequency bands be available on the MTR3000?

No, UHF is available now and VHF band will be rolled out in 2011.

Can I use the same analog subscribers I use on my MTR2000 on the MTR3000?

Yes, when you are operating in analog mode, the MTR3000 will support any analog conventional subscribers that you use on your MTR2000.

LTR and Passport Systems subscribers also can be used. However, subscribers programmed for Privacy Plus/SmartNet are not supported.

How many voice paths do I get per MTR3000 channel in digital mode?

In digital mode, you have two voice-paths per channel. Therefore, one MTR3000 base radio operating in MOTOTRBO mode can support two simultaneous transmissions.

Are there two voice paths in analog mode?

No, there is only one voice-path per channel in analog mode.

If I purchase a new MTR3000, can I still connect to my analog console?

Yes, Wireline is an option on the MTR3000 when operating in analog mode.

When I operate the MTR3000 in digital mode, can I connect to an analog console?

Yes, in a wireless configuration using a control station. Details are in the system planner.

Will I be able to use my voting comparator on the MTR3000?

No. Voting is not currently supported on the MTR3000.

What forms of backhaul are available for use with the MTR3000?

Any Backhaul that supports IP can be utilized, such as Point to Point. In analog operation, standard E&M and wireline options support circuit-based connectivity.

Can MTR3000 function in a cross-banding configuration?

No, MTR3000 does not currently support cross-banding of frequencies.

Will MTR3000 function in SMARTNET®, Privacy Plus™ or SmartZone™ Trunking systems?

No, these systems will not be supported in MTR3000.

What are the feature differences between MTR3000 and MOTOTRBO 40W repeater?

At a high level, the MTR3000 is a high power (100W Continuous duty) station that has higher receiver specifications that provide better audio performance in RF dense areas. Other differences include; additional frequency bands, analog wire-line, increased general purpose inputs and outputs (GPIO), and serviceably ports access from the front panel.

Will MTR3000 still use the same wireline connector as MTR2000?

No. It is now a detachable screw terminal type connector.

Will I be able to diagnose problems with the MTR3000 remotely?

Yes. A new software application called Repeater Diagnostic and Control (RDAC) will provide Diagnostic Alarm and Control for the MTR3000 when used over an IP network.

Can I use my MTR2000 RSS to program the MTR3000?
No, you must use the MOTOTRBO CPS. This is the same CPS that you will use for the MOTOTRBO repeater stations, mobiles, and portables.

What cable is used to program the MTR3000 CPS?
A standard type A to type B USB cable is used.

Will an external interface still be required to hook up to the 96 pin connector?
No, with the exception of the E&M interface (see the Product Planner for details). The COR, PTT, TX Audio, RX Audio, external power tap and GPIO will use a DB25 connector.

MTR2000 MOTOTRBO UPGRADE FAQ

How long will it take me to upgrade a MTR2000 to MOTOTRBO?
Depending on the proficiency of the technician, it will take 15 to 30 minutes to upgrade the station hardware. The station configuration will require additional time and is dependant upon the customer's specific configuration and proficiency of the technician.

Can I upgrade my analog MTR2000 to an analog MTR3000?
Yes, you can upgrade an MTR2000 and still use the MTR3000 in analog mode. Because some analog functionality would be lost in this transition, this application would be best applied to a customer who intends to migrate to MOTOTRBO soon after.

Can I upgrade my 30-40W MTR2000 station to MTR3000?
An upgrade for low power stations will be available in a future release

Can I upgrade a MTR2000 Receiver to MTR3000?
No, only base station and repeater upgrades are supported. MTR3000 is not available as a receiver.

If I upgrade a MTR2000 to a MTR3000 will my entire station now be under warranty?
If the warranty has expired on the remainder of the station, only the upgrade components will be covered under a 1 year standard warranty. This is determined by the serial number on the station control module. It is recommended to have your Factory Order (FO) number when calling into Motorola for support.

When I upgrade a MTR2000 to MTR3000, can I use both analog and digital subscribers on the same station?
Yes, the Dynamic Mixed mode feature allows both analog and digital subscribers to use the same repeater on a call-by-call basis.

If I have two MTR2000 stations today, can I upgrade only one station to MTR3000 in MOTOTRBO mode and keep the other MTR2000 in analog mode?
Yes, you can set up a mixed mode system. This is one method to gradually migrate your subscriber units when you cannot fund all new MOTOTRBO subscribers. If you upgrade only one station, the MOTOTRBO radios will use the MTR3000 and the analog radios will use the MTR2000 station. It is recommended to purchase the Dynamic Mixed Mode feature when it is available, which offers a one station solution.

- MTR3000 Installation and User Manual
- MTR3000 Basic Service Manual
- MTR3000 Catalog Sheet
- MTR3000 Product Planner
- MOTOTRBO System Brochure
- MOTOTRBO System Planner
- MOTOTRBO IP Site Connect Brochure
- Introduction to MTR3000 Training. Technical training is now available.

Note: Manuals, system planners and brochures can be downloaded from the MOTOROLA ONLINE Resource Center.

www.motorola.com/caribbean/businessradios

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